

CLAIMS

1. A diversity receiving apparatus for receiving a packet having embedded therein symbols which are multiple repetitions
5 of a pattern signal having a predetermined pattern, the apparatus comprising:

a plurality of antennas;

an antenna switching section for selecting an antenna from the plurality of antennas and outputting a signal received by the
10 selected antenna as a received signal;

a gain amplifier section for amplifying the received signal outputted from the antenna switching section and outputting the amplified signal;

a gain control section for controlling a gain of the gain
15 amplifier section;

a power measurement section for measuring an instantaneous power of an output signal from the gain amplifier section;

an averaging section for taking an average of the instantaneous power measured by the power measurement section on
20 an averaging period-by-averaging period basis, and measuring the average powers, the averaging period having the same time length as one period of the pattern signal; and

a control section for controlling the gain control section so that the gain amplifier section has a desired gain, and
25 controlling a selection of the antennas made by the antenna

switching section, wherein

during all or part of a time period during which the pattern signals are received, the control section allows the gain control section to fix the gain of the gain amplifier section, allows the
5 antenna switching section to sequentially switch the selection of the antennas during antenna switching periods which are synchronized with the averaging periods, and determines an antenna to receive data contained in the packet, based on levels of the average powers measured by the averaging section on an averaging
10 period-by-averaging period basis.

2. The diversity receiving apparatus according to claim 1, wherein

during a waiting time for the pattern signals, the control
15 section controls the gain control section such that the gain amplifier section amplifies the received signal with a first fixed gain, and allows the antenna switching section to sequentially switch the selection of the antennas during the antenna switching periods, and

20 if any of the levels of the average powers measured by the averaging section during the waiting time for the pattern signals exceeds a first threshold value, the control section determines as the antenna to receive the data an antenna which had been selected during an averaging period where the highest average power was
25 measured.

3. The diversity receiving apparatus according to claim 2, wherein if any of the levels of the average powers measured by the averaging section during the waiting time for the pattern signals exceeds the first threshold value, the control section compares between the average power exceeding the first threshold value and an average power measured during an averaging period subsequent to an averaging period where the average power exceeding the first threshold value is measured, and determines as the antenna to receive the data an antenna which had been selected during an averaging period where the highest average power was measured.

4. The diversity receiving apparatus according to claim 2, wherein

15 if any of the levels of the average powers measured by the averaging section during the waiting time for the pattern signals exceeds a second threshold value which is higher than the first threshold value, the control section controls the gain control section such that the gain amplifier section amplifies the received

20 signal with a second fixed gain which is lower than the first fixed gain, and allows the antenna switching section to sequentially switch the selection of the antennas during the antenna switching periods so that the plurality of antennas are all selected, and

the control section determines as the antenna to receive

25 the data an antenna which had been selected during an averaging

period where the highest average power was measured among all average powers measured using the second gain.

5 4, further comprising:

a correlation section for determining a correlation value between a signal outputted from the gain amplifier section and the pattern signal; and

10 a correlation detection section for detecting a timing at which the pattern signal is received, based on the correlation value determined by the correlation section and the average power measured by the averaging section, wherein

15 if any of the levels of the average powers measured by the averaging section during the waiting time for the pattern signals is lower than the first threshold value and a reception of the pattern signal is detected by the correlation detection section, the control section controls the gain control section such that the gain amplifier section amplifies the received signal with a third fixed gain which is higher than the first fixed gain, and
20 allows the antenna switching section to sequentially switch the selection of the antennas during the antenna switching periods so that the plurality of antennas are all selected, and

the control section determines as the antenna to receive the data an antenna which had been selected during an averaging
25 period where the highest average power was measured among all

average powers measured using the third gain.

6. The diversity receiving apparatus according to claim 1, wherein

5 during a waiting time for the pattern signals, the control section controls the gain control section such that the gain amplifier section amplifies the received signal with a first fixed gain, and allows the antenna switching section to sequentially switch the selection of the antennas during the antenna switching
10 periods,

if any of the levels of the average powers measured by the averaging section during the waiting time for the pattern signals exceeds a second threshold value, the control section controls the gain control section such that the gain amplifier section
15 amplifies the received signal with a second fixed gain which is lower than the first fixed gain, and allows the antenna switching section to sequentially switch the selection of the antennas during the antenna switching periods so that the plurality of antennas are all selected, and

20 the control section determines as the antenna to receive the data an antenna which had been selected during an averaging period where the highest average power was measured among all average powers measured using the second gain.

25 7. The diversity receiving apparatus according to claim

1, further comprising:

a correlation section for determining a correlation value between a signal outputted from the gain amplifier section and the pattern signal; and

5 a correlation detection section for detecting a timing at which the pattern signal is received, based on a peak of the correlation value determined by the correlation section and the average power measured by the averaging section, wherein

during a waiting time for the pattern signals, the control
10 section controls the gain control section such that the gain amplifier section amplifies the received signal with a first fixed gain, and allows the antenna switching section to sequentially switch the selection of the antennas during the antenna switching periods,

15 if any of the levels of the average powers measured by the averaging section during the waiting time for the pattern signals is lower than a first threshold value and a reception of the pattern signal is detected by the correlation detection section, the control section controls the gain control section such that the
20 gain amplifier section amplifies the received signal with a third fixed gain which is higher than the first fixed gain, and allows the antenna switching section to sequentially switch the selection of the antennas during the antenna switching periods so that the plurality of antennas are all selected, and

25 the control section determines as the antenna to receive

the data an antenna which had been selected during an averaging period where the highest average power was measured among all average powers measured using the third gain.

5 8. The diversity receiving apparatus according to claim 1, wherein

 during a waiting time for the pattern signals, the control section controls the gain control section such that the gain amplifier section amplifies the received signal with a first fixed
10 gain, and allows the antenna switching section to sequentially switch the selection of the antennas during the antenna switching periods, and

 if any of the levels of the average powers measured by the averaging section during the waiting time for the pattern signals
15 exceeds a second threshold value, the control section determines as the antenna to receive the data an antenna which had been selected during an averaging period where the average power exceeding the second threshold value was measured.

20 9. The diversity receiving apparatus according to claim 1, further comprising:

 a correlation section for determining a correlation value between a signal outputted from the gain amplifier section and the pattern signal; and

25 a correlation detection section for detecting a timing at

which the pattern signal is received, based on a peak of the correlation value determined by the correlation section and the average power measured by the averaging section, wherein

during a waiting time for the pattern signals, the control section controls the gain control section such that the gain amplifier section amplifies the received signal with a first fixed gain, and allows the antenna switching section to sequentially switch the selection of the antennas during the antenna switching periods, and

if any of the levels of the average powers measured by the averaging section during the waiting time for the pattern signals is lower than a first threshold value and a reception of the pattern signal is detected by the correlation detection section, the control section determines as the antenna to receive the data an antenna which had been selected during an averaging period where the average power lower than the first threshold value was measured.

10. The diversity receiving apparatus according to claim 1, wherein the gain control section controls the gain of the gain amplifier section using a gain value based on an average power of a signal received by the antenna having been determined by the control section.

11. A wireless receiving apparatus for receiving a packet having embedded therein symbols which are multiple repetitions

of a pattern signal having a predetermined pattern, the apparatus comprising:

a diversity receiving apparatus for selecting an antenna and receiving the packet; and

5 a demodulation section for demodulating a signal received by the diversity receiving apparatus, wherein

the diversity receiving apparatus includes:

a plurality of antennas;

an antenna switching section for selecting an antenna from
10 the plurality of antennas and outputting a signal received by the selected antenna as a received signal;

a gain amplifier section for amplifying, before or after a frequency conversion, the received signal outputted from the antenna switching section and outputting the amplified signal;

15 a gain control section for controlling a gain of the gain amplifier section;

a power measurement section for measuring an instantaneous power of an output signal from the gain amplifier section;

an averaging section for taking an average of the
20 instantaneous power measured by the power measurement section on an averaging period-by-averaging period basis, and measuring the average powers, the averaging period having the same time length as one period of the pattern signal; and

a control section for controlling the gain control section
25 so that the gain amplifier section has a desired gain, and

controlling a selection of the antennas made by the antenna switching section, wherein

5 during all or part of a time period during which the pattern signals are received, the control section allows the gain control section to fix the gain of the gain amplifier section, allows the antenna switching section to sequentially switch the selection of the antennas during antenna switching periods which are synchronized with the averaging periods, and determines an antenna to receive data contained in the packet, based on levels of the
10 average powers measured by the averaging section on an averaging period-by-averaging period basis.